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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/067,208	04/28/98	HOWARD	W P-7860

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EXAMINER

CREPEAU, J

ART UNIT

PAPER NUMBER

1745

11

DATE MAILED: 10/30/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action Summary

Application No.
09/067,208

Applicant(s)
Howard

Examiner
Jonathan Crepeau

Group Art Unit
1745



☒ Responsive to communication(s) filed on Sep 6, 2000

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-8, 10-17, 28-35, 37-44, 46-53, 55-62, 64-71, 73-80, 82-89, and 91 are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-8, 10-17, 28-35, 37-44, 46-53, 55-62, 64-71, 73-80, 82-89, and 91 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1-8, 10-17, 28-35, 37-44, 46-53, 55-62, 64-71, 73-80, 82-89, and newly added claim 91. The claims remain rejected over the art of record, as necessitated by amendment. Therefore, this action is made final.

Claim Rejections - 35 USC § 103

2. Claims 1-8, 10-17, and 37-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al (U.S. Pat. 5,549,717) in view of Kelm (U.S. Pat. 5,486,215).

In Figure 4 and in column 3, line 36-column 4, line 55, Takeuchi et al. teach an electrode assembly having two substantially straight sides and comprising spirally-wound anode and cathode assemblies. The anode assembly comprises a nickel current collector (68) and lithium strips (64, 66). A tab (72) extends from the edge of current collector 68. Current collector 68 has a smaller length and width than the length and width of lithium strip 66 (see col. 4, line 39). The cathode assembly comprises silver vanadium oxide active material (47) which is embedded into a titanium current collector (54). The current collector 54 comprises tabs (48, 50) extending from the edges. Takeuchi et al. incorporate by reference the disclosure of Keister et al (U.S. Pat. 4,830,940), which discloses that the cathode can comprise a mixture of silver vanadium oxide,

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PTFE binder, and graphite powder conductivity enhancer (col. 8, lines 37-42 of Keister et al).

In column 4, line 26, Takeuchi et al. disclose that the separator surrounding the cathode assembly is sealed on all three open sides so that only the tabs project. In column 5, line 25, Takeuchi et al. disclose that alternatively, a separator may be folded around the anode assembly in a manner similar to the cathode assembly.

Takeuchi et al. do not explicitly teach the exact length and height of the anode current collector as a percentage of the length and height of the lithium strip. The reference also does not explicitly teach that separators cover *both* the cathode and anode assemblies.

Kelm teaches separators covering spirally wound anode and cathode assemblies in column 4, lines 60-66 and column 5, line 52.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the patent of Kelm shows that using separators simultaneously on the anode and cathode assemblies is well known in the art. Although Takeuchi et al. in effect disclose that a separator is placed on either the anode *or* the cathode assembly, the artisan would understand that covering both electrode assemblies (as shown by Kelm) would be an advantageous modification of the battery of Takeuchi et al. because dendrite protection would be increased and delamination of both active material layers would be decreased. As stated in Kelm at column 3, line 5, "[t]he separator pouch then prevents the transport of stray material in the cell which could cause a short circuit and the double thickness of the separator between anode and cathode elements better resists damage during the winding process". Additionally, although

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Takeuchi et al. do not explicitly teach that tab(s) project through slits in the separators, this configuration is also clearly shown in Kelm and is considered to be obvious to the skilled artisan.

Additionally, the length and height of the current collector are parameters which may be optimized by the artisan to achieve a particular result, i.e., the utilization rate of active material, current density, etc. It has been held that when the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation (*In re Aller, Lacey, and Hall*, 105 USPQ 233).

3. Claims 28-35, 82-89 and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goebel et al (U.S. Pat. 4,565,752) in view of Kelm.

In Figures 1-6, Goebel et al. teach an electrode assembly comprising spirally-wound anode and cathode assemblies. The anode assembly comprises a nickel current collector (29) and adherent lithium strips (30) (see col. 3, lines 16-22). A tab (32) extends from the edge of the current collector. The cathode assembly comprises carbon black catalyst (20) which is layered on a nickel or stainless steel current collector (23). From Figs. 1 and 2, it is apparent that the anode current collector 29 has a smaller length and width than the length and width of the cathode current collector 23.

Goebel et al. do not explicitly teach that the electrode assembly has “two substantially straight sides”, that the cathode current collector has a tab extending from its edge, or the exact

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length and height of the anode current collector as a percentage of the length and height of the cathode current collector. The reference also does not explicitly teach that the cathode current collector is made of titanium, or that the cathode mixture comprises silver vanadium oxide, PTFE binder, and a carbon conductivity enhancer. The reference also does not explicitly teach that separators cover both the cathode and anode assemblies and provide seals around each electrode and openings through which tab(s) project.

Kelm teaches this latter configuration in column 4, lines 60-66 and column 5, line 52. Kelm further teaches a cathode assembly comprising a silver vanadium oxide, PTFE, and carbon black mixture pressed onto a titanium current collector in column 5, lines 25-52.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the patent of Kelm shows that pouch-type separators are known in the art and are used in cells similar in structure to Goebel et al. The artisan would understand that covering both electrode assemblies (as shown by Kelm) would be an advantageous modification of the battery of Goebel et al. because dendrite protection would be increased and delamination of both active material layers would be decreased. Additionally, although Goebel et al. not explicitly teach that the tab(s) project through slits in the separators, this configuration is also clearly shown in Kelm and is considered to be obvious to the skilled artisan.

Furthermore, the patent of Kelm shows that the specific combination of cathode components recited in the instant claims is known in the art and is used in cells similar in structure

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to Goebel et al. As would be appreciated by the artisan, these materials result in cells that are capable of delivering high current pulses and which are useful in cardiac defibrillator applications. Therefore, the artisan would have sufficient motivation to use the cathode materials of Kelm in the battery of Goebel et al.

Additionally, the cell of Goebel could be said to comprise two “substantially straight” sides. The term “substantially” indicates that the sides do not have to be *completely* straight, and thus, the cylindrical cell of the reference is considered to meet this limitation. Additionally, spirally-wound cells with flat sides are known in the art, as exemplified by several references of record. The outer shape of the cell may be manipulated as desired by the artisan and is therefore not considered to distinguish over the reference.

Regarding the limitations in the instant claims which recite the length and height of the anode current collector as a percentage of the length and height of the cathode current collector, these lengths and widths are optimizable parameters for the reasons explained in paragraph 2 above, and are thus rendered obvious to the skilled artisan.

4. Claims 46-53, 55-62, 64-71, and 73-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. in view of Kelm as applied to claims 1-8, 10-17, and 37-44 above, and further in view of Goebel et al.

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The combination of Takeuchi et al. and Kelm do not explicitly teach that the cathode current collector is longer and wider than the anode current collector.

Goebel et al. disclose a spirally-wound cell in Figs. 1 and 2 comprising a cathode current collector (23) that is both longer and wider than the anode current collector (29).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to incorporate the configuration of Goebel et al. into the cell of Takeuchi et al. In Figure 2 and in column 3, lines 7-9, Takeuchi disclose a cell casing which functions as a terminal (i.e., the cell is either "case-positive" or "case-negative"). Upon inspection of the Goebel et al. reference, it is apparent that the oversized cathode current collector is designed to facilitate the construction of the cell as a case-positive cell (i.e., the entire outside of the cell except for the negative terminal acts as the positive terminal). In column 1, lines 41-50, Goebel et al. state that their design is economical while being mechanically and electrically sound, as compared to other designs to hold a battery stack in position. Therefore, the artisan would be motivated to incorporate the oversized cathode current collector configuration into the cell of Takeuchi et al. in hopes of creating a more mechanically stable and economically viable battery.

Additionally, regarding the limitations in the instant claims which recite the length and height of the anode current collector as a percentage of the length and height of the cathode current collector, these lengths and widths are optimizable parameters for the reasons explained in paragraph 2 above, and are thus rendered obvious to the skilled artisan.

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Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisors, Steve Kalafut or Carol Chaney, can be reached at (703) 308-0433 and (703) 305-3777, respectively. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900.


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Documents may be faxed to (703) 306-3429. The official fax number for documents of extreme importance is (703) 305-3599 (it will take longer to receive documents faxed to this number; therefore the first number is preferred).

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

October 26, 2000


STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP 1700